While peeling the bark from a freshly cut black locust post, I noticed that the cambium layer smelled precisely like bruised green beans. The scent was recognized by several others without my telling them what I had observed. I have not yet tested further whether this novel way of tracing the affinity of plants may be made useful or not.—J. M. MILLIGAN, *Jacksonville, Ill*

When in Crawfordsville, Ind., a few weeks ago, I was pleased to find in the grounds of Prof. Wm. C. White, some beautiful plants of *Euphorbia dentata*. They had neither been planted there nor escaped from elsewhere, but evidently were relics of the old times when the forest in all that region was unbroken.—J. M. C.

JUNIPERUS OCCIDENTALIS IN COLORADO.—Since my arrival at this Agency, my attention has been drawn to the Juniper which, mixed with *Pinus edulis*, covers the mesas and foot hills throughout this part of S. W. Colorado. Its botanical character seemed to be so distinct from *J. Virginiana*, that I at once thought it to be *J. occidentalis*, with the description of which, in Clarence King's Report on the Botany of the 40th parallel, it seems to agree perfectly. But he says "not reported from Colorado." Neither is it spoken of in Hayden's Synopsis of the Colorado Flora, 1874. The exploring parties since then may have discovered and published its occurrence here. The tree rarely becomes conical like *J. Virginiana*, the fruit always glaucous, and two or three times as large as the fruit of that species. Heart wood usually brown, rarely red. Height 12–20 feet. Branches wide spread.—WILLIAM F. FLINT, *Los Pinos, Indian Agency, Colorado.*

THE BIG TREES, BY J. G. LEMMON.—In 1875, I took a trip of 400 miles to revisit the Big Trees, count their rings and bring away sprays, cones, seeds, bark and wood sections for the Centennial. I visited several groves, closely examined hundreds of trees, especially giving attention to the fallen and shattered monsters, generally larger than living trees of the same grove.

The great *Sequoias* are monsters indeed for size and magnificent in their columnar appearance; they are well worthy a trip across the continent to behold, but why exaggerate their age? The truth is strange enough. "Over-statement," Dr. Gray mildly puts it. It is, indeed, a wonderful deviation from the truth when to large figures we add double their sum. From this time forward I must help fight the "over-statement." The battle will be long and fierce, no doubt, for the story of 3,000 or 4,000 years is very proudly related and never fails to excite interest; and it is repeated in nearly every guide book for tourists, moreover reiterated by eminent travelers and close observers, including John Muir, than whom none gives us such charming views of mountain scenery, such picturesque forest studies. But let the truth always be told, searching for it, if need be, under the most deceptive appearances. I scold myself daily because, for want of time, I took the figures of reputed authorities and gave currency to the big story of the Big Trees. Let me retract so much of last year's "Scene 11, The Big Trees," as was carelessly based upon their reported great age of 3,000 or 4,000 years, and substitute the following cold facts and estimates. I substitute the true figures cheerfully, gladly, triumphantly. The big trees are but 1,200 to 1,500 years old, and I am glad they are not older. There is proud satisfaction in the thought, but let me repress my joy and its reason for the present and proceed with the cool facts.

On the 1st of September, 1875, I arrived at the famous Mammoth Grove of Big Trees in Calaveras county, and at once commenced careful observations.

First, a quiet, reverential walk among the tall fluted columns, my spirit dumb with wonder, my mind raised to sublime conceptions, my reason almost persuaded that any large story of the great *Sequoias* must be true. Round and round, in and out among the vast trunks the well-worn path leads. Here and there a long flight of steps enables the visitor to reach the upper side of the fallen trunks, where a most impressive view

and delightful promenade may be enjoyed. Marble slabs imbedded in the soft bark, high up on each tree, bear its name and generally the initials of the namer. Near the road, almost the first to greet the visitor approaching from the north, stands a group of noble trees bearing the names of Henry W. Longfellow, Prof. John Dana, Dr. John Torrey and Prof. Asa Gray. During this first half-day of silent gazing, I found myself frequently returning to this group of scientists with a sublime poet added, and trying to commune with the master spirits they commemorate. During my last call a cone from the lofty crown of "Prof. Asa Gray" fell at my feet; eagerly I seized it and wrapped it in paper; another and another followed. The squirrels were harvesting, so the seed must be ripe. I drew my army revolver and fired a round of six cartridges up into the crown, rewarded by the fall of a limb bearing a dozen cones. As I bore away the beautiful little cones with their tiny, parsnip-like seeds, I thought how much this precious fruit symbolizes those richer fruits which that other Professor Gray showers upon all who but ask his bounty. Hard at work in the great herbarium at the Cambridge University, he is devoting, perhaps, the last herculean energies of a life filled with toil to the completion of our California Botany. Receiving no salary while on this extra work, and hiring assistants in special fields, he toils almost incessantly, ever the master mind to direct research, ever the umpire to decide knotty points, yet ever the kind patron, ready to turn aside, examine the plants of the young collector and help the humblest applicant for knowledge.

Then the good doctor's tenacity for truth is so strong! No big stories for him, no flights of fancy, no careless writing! I think of this with bated breadth, compressed lips, clenched hands and firm tread as I prepare for work in earnest on the morrow.

The stump of the very large tree which was bored off with pump augers in 1852 to form the floor of a house, affords a fine opportunity for counting, since it is so evenly smoothed off, but still more time is necessary to do it accurately than most observers allow themselves. This tree should certainly be considered a fair sample of the oldest of the present generation, for it is one of the largest ever seen. Its circuit at base is 97 feet by my tape line, held at one end by a Puritan and master builder from Boston. Longest diameter without bark, five feet above the base, 24 feet 10 inches. Shortest diameter, 22 feet eight inches. The bark averages 18 inches in thickness, making the entire longest diameter of the tree at five feet above base, over 27 feet. A few other trees are met with measuring as much or more at base, but they are generally swollen outward and hollow like the shaft of a light house. This monster tree was as straight and sound as a candle, hence it was undoubtedly the largest perfect tree ever yet seen.

I spent nearly a day counting the rings of this stump, and of the butt cut of the tree lying near it. I counted carefully both ways, putting in pins to mark the place of hundreds. The stump being a little irregular in consequence of its near roots, I counted in three places along three equidistant rays. The first count was 1,260 rings, the second count was 1,258 rings and the third count was 1,261 rings—average age, 1,260 years. Counting on the butt, cut 24 feet from the base, the rings were of course a few less, 1,242 in number, but all very plainly discernible, and presenting exact uniformity in their decrease in thickness, from heart to bark. I availed of this uniformity of decrease by establishing, after many counts of different trees, a rule for determining the mean number of rings to the linear foot, and fixing the locality on a cut across these trees where the rings are of average thickness. That point is just one third of the distance from the bark to the heart. At the heart the grains are often three-eighths of an inch thick, at the bark as thin as paper. The average, as determined by countings of all the logs in the grove which have been cut across, some half dozen or more, clearly established the rule that the rings of average width are found one-third of the way from the bark to the heart. This rule proved very useful afterward in estimating age of broken trunks.

Hercules.—This monster tree was leveled to the earth by a gale in 1862. His body has been repeatedly cut across by an ingenious device, and the timber manufactured into relics and carried away. He was 285 feet high, and now measures 14 feet in diameter 25 feet from his roots. A careful count of his rings showed only 1,232 years. Eighty-eight of these rings, the average number to the half foot, just covered the space of half a foot at the distance of two and one-third feet from the bark, which is one-third the way to the heart, as seen above. This tree is often reported as over 3,000 years old!

(To be continued.)